IN THE CLAIMS:

1-16. (Canceled)

17. (Currently Amended) A method for controlling the pressure in at least one inflatable cuff of a blood pressure measuring apparatus in closed-loop operation, where the pressure on the cuff equals the arterial pressure, with a plethysmographic sensor device, whereby a plethysmographic signal PG and a cuff pressure signal BP are obtained, comprising the following steps:

a) in a first, concentric inner control loop the cuff pressure signal BP is used as control variable and is fed into a difference amplifier as a first input signal,

b) in a second, concentric outer control loop, which is simultaneously active for closed-loop operation, the plethysmographic signal PG, with its mean value $\overline{PG}$ suppressed, is fed into a controller and is added to a set-point signal SP, and a target signal SW is generated, which is fed into said difference amplifier as a second input signal, ~~and~~

c) an output signal AS of the difference amplifier is used to control at least one valve connected to a pressure source, which in turn regulates the pressure in the cuff, and

d) no re-adjustments of set-point during open-loop operation with the help of a state-switch and timing-circuits.

18. (Currently Amended) The method according to claim 17, wherein the mean value $\overline{PG}$ of the plethysmographic signal PG is determined in a third concentric control loop, which is simultaneously active during closed-loop operation and continuously corrected as input signal of the second control loop.

19. (Currently Amended) The method according to claim 17, wherein the amplification parameters P, I and/or D are optimized in a fourth concentric control loop, which is simultaneously active during closed-loop operation by means of the plethysmographic signal PG and the cuff pressure signal BP, and are continuously corrected as inputs to the controller.

20. (Currently Amended) The method according to claim 17, wherein in a fifth concentric control loop, which is simultaneously active during closed-loop operation, the set-point signal SP is readjusted, depending on the integral of the plethysmographic signal PG.

21. (Currently Amended) The method according to claim 17, wherein in a sixth concentric control loop, which is simultaneously active during closed-loop operation, the set-point signal SP is readjusted on the basis of derived quantities, such as amplitude, mean value or wave form of the plethysmographic signal PG and the cuff pressure signal BP, using a fuzzy-logic-approach.

22. (Currently Amended) The method according to claim 17, wherein in a seventh concentric control loop, which is simultaneously active during closed-loop operation, the set-point signal SP is readjusted in dependence of the pulse waveform of the cuff pressure signal BP.

23. (Currently Amended) The method according to claim 17, wherein in an eighth concentric control loop, which is simultaneously active during closed-loop operation, the set-point signal SP is readjusted by means of neural networks, auto-regressive models or self-learning models.

24. (Cancel)

25. (Currently Amended) A device for controlling the pressure in at least one inflatable cuff of a blood pressure measuring apparatus in closed-loop operation, where the pressure in the cuff equals the arterial pressure, comprising a plethysmographic sensor device for obtaining a plethysmographic signal PG and a pressure sensor for obtaining a cuff pressure signal BP, including two concentric control loops, which are simultaneously active during closed-loop operation, acting on a difference amplifier, the first, inner control loop uses the cuff pressure signal BP as a first control variable and the second, concentric outer control loop includes a controller which generates a target variable SW from the plethysmographic signal PG as a second control variable, and wherein the output of the difference amplifier controls at least one valve connected to a pressure source, thereby regulating the pressure in the cuff.

26. (Currently Amended) The device according to claim 25, wherein the second concentric control loop, which is simultaneously active during closed-loop operation, is provided with a difference amplifier which subtracts the plethysmographic signal PG from its mean value $\overline{PG}$, and with a summation unit adding a set-point signal SP.

27. (Previously Presented) The device according to claim 26, wherein a device is provided for computing an initial value for the mean value of the plethysmographic signal.

28. (Previously Presented) The device according to claim 26, wherein a device is provided for computing an initial value for the set-point signal SP.

29. (Previously Presented) The device according to claim 25, wherein said difference amplifier controls an inlet valve connected to a pressure source via a non-inverting amplifier unit and an outlet valve via an inverting amplifier unit, said valves being pressure-connected to the inflatable cuff.

30. (Previously Presented) The device according to claim 25, wherein said valves being pressure-connected to the inflatable cuff are designed as proportional valves.

31. (Previously Presented) The device according to claim 25, wherein said difference amplifier is designed as a comparator which actuates at least one digital switching valve for pressure regulation in the cuff.

32. (Previously Presented) The device according to claim 25, wherein the plethysmographic sensor is furnished with a device for the elimination of stray light or ambient light from the plethysmographic signal PG.

33. (Previously Presented) The device according to claim 25, wherein the light source of the plethysmographic sensor is furnished with circuitry for controlling its voltage or current.

34. (Previously Presented) The device according to claim 25, wherein said at least one inflatable cuff is a finger cuff.

35. (Previously Presented) The device according to claim 25, wherein said controller is a PID-controller.